BEYOND VIRAL SUPPRESSION: EXPLORING GENDER DISPARITIES IN QUALITY OF LIFE AMONG PEOPLE LIVING WITH HIV IN GOMBE, NIGERIA

Suraj, A.[1*], Kwami, I.A.[2], Paul, B.[3], Abubakar, A.[4], Bappah, L.[5] and Kuye, J.[6]

[1]Department of Community Medicine, College of Medical Sciences, Gombe State University, P.M.B. 0127, Gombe, Nigeria.

[2]Department of Geology, Gombe State University, P.M.B. 0127, Gombe, Nigeria.

[3]Janna Health Foundation, Adamawa State, Nigeria.

[4]Federal Collage of Education Katsina, Katsina State.

[5]Department of Education Foundations, Gombe State University.

[6]John Snow Inc. (JSI), TB DIAH Project, Abuja, FCT, Nigeria.

*Corresponding email: drsurajkwami@gmail.com

ABSTRACT

HIV/AIDS remains a major public health challenge in sub-Saharan Africa, with Nigeria bearing a significant burden. Despite high ART retention rates in Gombe State, disparities in health-related quality of life (HRQoL) persist, particularly along gender lines. Socioeconomic vulnerabilities, stigma, and sociocultural factors continue to impact well-being. This study aims to assess gender differences in HRQoL among PLHIV in Gombe and identify key factors contributing to these disparities to inform targeted interventions. A cross-sectional survey of 400 HIV-positive adults attending 10 healthcare facilities used WHOQOL-HIV BREF and stigma scales. Data analysis included t-tests and regression models. Women reported significantly lower HRQoL scores across all domains than men ($p<0.001$). Higher stigma and socioeconomic vulnerabilities were associated with poorer HRQoL, especially among females. Addressing stigma and socioeconomic barriers with gender-sensitive strategies is essential to improve HRQoL and health outcomes for PLHIV in Gombe. The study recommends implementing targeted, multifaceted interventions to enhance HRQoL among PLHIV in Gombe. These should prioritize stigma reduction initiatives, gender-responsive mental health and psychosocial support, economic empowerment strategies, and expanded access to quality healthcare, particularly in underserved rural communities.

Keywords: HIV/AIDS, HRQoL, gender disparities, stigma, Nigeria

1 INTRODUCTION

At nearly two-thirds of all infections worldwide, HIV/AIDS continues to be one of the most urgent public health issues in sub-Saharan Africa [1]. There are about 10.9 million HIV-positive individuals in Nigeria, making it the country with the second-largest HIV epidemic globally [2]. Even though the nation has made great strides toward increasing the use of antiretroviral therapy (ART)—it now stands at 89 percent nationwide—health outcomes, such as HRQoL, continue to differ by population

and region [2]. In the northeast, especially in states like Borno, Yobe, Adamawa, and Gombe, socioeconomic inequality, a protracted conflict (the Boko Haram insurgency), and inadequate healthcare infrastructure create additional difficulties [3]. Treatment adherence and viral suppression have been compromised by ART services being disrupted by attacks on healthcare facilities and displacement [4]. Gombe reports that 57% of PLHIV face discrimination, which is higher than the 48% national average [5]. Gender inequality makes these issues even worse: although women make up 60% of ART patients, they are stigmatized more than men (65% vs. 45% for men) and have poorer mental health outcomes, which are indicative of larger societal obstacles to healthcare autonomy and access [6]. Gombe State maintains one of the highest ART retention rates in Nigeria, at an astounding 96%, in spite of these challenges [5]. However, new research indicates that increased wellbeing is not always correlated with high retention rates. Despite viral suppression surpassing 90%, mental health and overall HRQoL are still extremely low, according to studies conducted in nearby Borno and Kano [7, 8]. An important factor is socioeconomic status; in Kano, employed women on ART reported HRQoL that was 20% higher than that of their unemployed counterparts, demonstrating how structural factors like rurality, social support, and employment influence results [8]. An important research gap still exists in the understanding of gender-specific HRQoL disparities in Gombe's ART program, specifically the intersections of economic vulnerability, stigma, and conflict. Studies have not yet looked into why high retention rates, which have been seen in other post-conflict African contexts, do not translate into improved well-being. Evaluations that compare to southern Nigeria (e.g., Lagos, where stigma is lower [39 percent] and HRQoL scores are 15 percent higher [9], may reveal context-driven ways to enhance interventions. This study investigates gender disparities in health-related quality of life (HRQoL) among HIV patients in Gombe State, exploring how stigma, employment, and sociocultural factors contribute to persistent wellbeing gaps despite high ART retention. It also aims to identify context-specific strategies by examining successful HIV care models across sub-Saharan Africa to address the paradox of sustained stigma and poor HRQoL. Given the paradox of high ART retention yet persistently low quality of life in Gombe State, it becomes imperative to move beyond clinical success indicators like viral suppression and examine the broader determinants of well-being. The disproportionate burden faced by women, reflected in higher levels of stigma, unemployment, and restricted access to care, highlights the need for a gender-sensitive analysis of HRQoL among PLHIV. This research responds to that need by systematically assessing gender disparities in HRQoL and identifying the key social, economic, and environmental factors that shape these outcomes. By focusing on the lived experiences of both male and female PLHIV across urban and rural settings, the study provides evidence to guide more equitable and holistic HIV care strategies in Gombe State.

2 METHODOLOGY

2.1 Study Setting and Population

The study was conducted in Gombe State, located in northeastern Nigeria, characterized by a mix of urban centers and rural communities. The research focused on 10 purposively selected healthcare facilities, including primary, secondary, and tertiary centers that provide ART services. These facilities were chosen to capture the heterogeneity of healthcare access and socio-cultural contexts within the state. The study population consisted of HIV-positive adults aged 18 years and above who had been on ART for at least six months. Participants were recruited from routine ART clinics, ensuring inclusion of individuals with stable treatment histories to assess consistent health outcomes and quality of life.

2.2 Sampling Strategy and Participant Recruitment

This study followed the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines to ensure methodological rigor in sampling and participant recruitment. A multistage sampling approach was used. In the first stage, health facilities were stratified into urban and rural categories, and five facilities from each category were randomly selected using a random number generator. In the second stage, eligible patients attending these facilities during clinic days were

systematically sampled at a ratio of 1:2 to achieve the target sample size of 400 participants, equally divided by gender (200 males and 200 females). Inclusion criteria included confirmed HIV diagnosis, on ART for at least six months, and willingness to participate. Exclusion criteria included critically ill patients unable to communicate effectively or those unwilling to consent.

2.3 Data Collection Procedures

Data collection was conducted over a 12-week period, from March to May 2024. A team of five trained research assistants, including nurses and social scientists, conducted face-to-face interviews in private consultation rooms to ensure confidentiality and comfort. Prior to data collection, the research team received training on ethical considerations, questionnaire administration, and cultural sensitivity. The questionnaires included: (1) Socio-demographic data: age, gender, education level, employment status, marital status, residence (urban/rural). (2) ART adherence: assessed using self-reported adherence scales. (3) Stigma experiences: measured using a validated HIV stigma scale adapted for the Nigerian context. (4) Health-Related Quality of Life (HRQoL): evaluated using the WHOQOL-HIV BREF, which covers six domains—physical, psychological, level of independence, social relationships, environment, and spirituality/religion. To enhance data quality, daily debriefings were held, and questionnaires were reviewed for completeness and consistency.

2.4 Data Management and Analysis

Data were double-entered into a password-protected database using EpiData, and discrepancies were resolved through cross-verification. The data were exported to SPSS version 25 for analysis. Descriptive statistics (means, standard deviations, frequencies, percentages) summarized participant characteristics. For inferential analysis: Independent t-tests compared HRQoL scores between males and females. One-way ANOVA tested differences across employment status, rural versus urban residence, and stigma levels. Multiple linear regression analyses identified independent predictors of HRQoL, with variables such as gender, stigma, employment, residence, age, and duration on ART included in the models. Interaction terms were tested to explore potential moderating effects of gender on the relationship between stigma and HRQoL. A significance level of $p<0.05$ was used for all statistical tests.

2.5 Ethical Considerations

The study protocol was reviewed and approved by the Gombe State Ministry of Health Ethical Review Board. Participants provided written informed consent after receiving detailed explanations of the study's purpose, procedures, potential risks, and benefits. Emphasis was placed on voluntary participation, confidentiality, and the right to withdraw at any time without affecting their healthcare services. Data confidentiality was maintained through anonymization and secure storage of records.

3 RESULTS AND DISCUSSION

3.1 Demographic Characteristics of Participant

The study included a total of 400 HIV-positive adults receiving ART in Gombe State, with an equal gender distribution of 200 males and 200 females. The participants' ages ranged from 18 to 60 years, with a mean age of 39.2 years (standard deviation ± 9.4). Females were slightly younger than males, with average ages of 37.8 and 40.6 years, respectively. The majority of participants (62%) resided in rural areas, reflecting the predominantly rural composition of Gombe State, while 38% lived in urban settings. Regarding employment status, more than half of the participants (58%) were employed, indicating a relatively high level of economic activity among the study population. The remaining 42% were unemployed or not engaged in formal employment. Participants had been on ART for a median duration of 2.5 years, with the range spanning from 6 months to 10 years, suggesting a diverse cohort in terms of treatment duration.

Table 1. Demographic Characteristics

Demographic Variable	Category / Description	Number (n)	Percentage (%)	Mean / Median (SD / Range)
Total Participants		400	100	
Gender				
	Male	200	50	
	Female	200	50	
Age (years)				39.2 (± 9.4)
	Female mean age			37.8 years
	Male mean age			40.6 years
Residence				
	Rural	248	62	
	Urban	152	38	
Employment Status				
	Employed	232	58	
	Unemployed / Not employed	168	42	
Duration on ART				Median 2.5 years (range: 6 months to 10 years)

3.2 Gender Differences in Health-Related Quality of Life (HRQoL) Among HIV Patients in Gombe State

3.2.1 Overall HRQoL Scores

The mean HRQoL score across all participants was 56.4 (SD ± 12.3) on a scale of 0-100. Females reported significantly lower HRQoL scores with a mean of 52.1 (SD ± 11.8), compared to males who had a mean score of 60.7 (SD ± 12.4), with the difference being statistically significant ($p<0.001$).

3.2.2 Domain-Specific Findings

Analysis across HRQoL domains revealed that females scored consistently lower than males in all areas, with notable disparities in physical health, psychological well-being, and social relationships (all $p<0.001$). Physical health domain: Females scored an average of 54.2, whereas males scored 61.3 ($p<0.001$). Psychological well-being: Females had lower scores (50.8) than males (59.2; $p<0.001$). Social relationships: Females reported poorer scores (49.5) compared to males (58.4; $p<0.001$). Environment and spirituality domains also showed statistically significant disparities favoring males. The results indicate a consistent pattern of lower HRQoL scores among female participants across all measured domains. The most substantial disparities were observed in the physical health, psychological well-being, and social relationships domains, with females scoring approximately 7–9 points lower than males. The statistically significant differences ($p<0.001$) across all domains suggest that gender plays a critical role in influencing perceived quality of life among PLHIV in Gombe.

Table 2. Gender Differences in HRQoL and Domain Scores

Variable / Domain	Female (n=200)	Male (n=200)	p-value
Overall HRQoL Score	52.1 (±11.8)	60.7 (±12.4)	<0.001
Physical Health Domain	54.2	61.3	<0.001
Psychological Well-being	50.8	59.2	<0.001
Social Relationships	49.5	58.4	<0.001
Environment Domain	55.0	62.0	<0.001
Spirituality / Religion	53.5	60.5	<0.001

Values are presented as mean scores with standard deviations in parentheses

3.3 Stigma and HRQoL

Participants experiencing high levels of stigma (> moderate stigma scale score) reported significantly lower HRQoL scores, with a mean of 48.3 (SD ± 10.5), compared to participants with low stigma levels who had a mean HRQoL score of 62.7 (SD ± 11.2) ($p<0.001$). Furthermore, females reported higher levels of perceived stigma, with a mean stigma score of 3.8 (on a 1-5 scale), compared to males who had a mean stigma score of 3.2 ($p=0.02$). This higher stigma perception among females was associated with lower HRQoL scores across domains.

3.4 Employment and Residence

Participants who were employed scored higher on overall HRQoL (mean 60.2, SD ± 12.0) compared to unemployed participants (mean 50.5, SD ± 13.1), with this difference being statistically significant ($p<0.001$). Additionally, urban residents reported higher HRQoL scores (mean 61.0, SD ± 11.5) than rural residents (mean 52.1, SD ± 12.8; $p<0.001$). These findings highlight the influence of socioeconomic and geographic factors on perceived wellbeing among PLHIV. Overall, higher levels of perceived stigma are associated with significantly lower HRQoL scores, with females experiencing both higher stigma levels and lower wellbeing. Employment and urban residence are protective factors associated with better HRQoL, emphasizing the socio-economic and geographic disparities affecting PLHIV in Gombe.

Table 3. Impact of Stigma, Employment, and Residence on HRQoL

Variable / Category	HRQoL Score (Mean ± SD)	p-value
Stigma Level		
- High stigma (> moderate)	48.3 (±10.5)	<0.001
- Low stigma (≤ moderate)	62.7 (±11.2)	
Gender and Stigma		
- Females	3.8 (mean stigma score)	0.02
- Males	3.2	
Employment Status		
- Employed	60.2 (±12.0)	<0.001
- Unemployed	50.5 (±13.1)	
Residence		
- Urban	61.0 (±11.5)	<0.001
- Rural	52.1 (±12.8)	

Note: Stigma scores are on a 1-5 scale, with higher scores indicating higher perceived stigma

3.5 Multivariate Analysis

The multivariate regression analysis identified several independent predictors of health-related quality of life (HRQoL) among HIV-positive individuals in Gombe State. Higher perceived stigma was strongly associated with lower HRQoL scores (β = -0.45, $p<0.001$), indicating that stigma significantly diminishes wellbeing regardless of other factors. Employment status emerged as a positive predictor; employed participants reported higher HRQoL (β = 0.32, $p=0.005$), suggesting that economic stability and social engagement contribute to improved quality of life. Gender also remained a significant predictor, with females experiencing lower HRQoL than males (β = -0.25, $p=0.01$), highlighting ongoing gender disparities. Additionally, residing in rural areas was negatively associated with HRQoL (β = -0.29, $p=0.003$), pointing to the influence of geographic and socio-economic factors. Overall, these findings underscore the critical roles of psychosocial and socio-economic factors in shaping wellbeing among PLHIV in Gombe. Regression analysis identified stigma (β = -0.45, $p<0.001$), employment status (β = 0.32, $p=0.005$), gender (β = -0.25, $p=0.01$), and rural residence (β = -0.29, $p=0.003$) as independent predictors of HRQoL. Gender remained a significant predictor after adjusting for other variables, with females having lower HRQoL scores.

Table 4. Summary of multivariate regression analysis

Predictor Variable	Standardized Beta Coefficient (β)	p-value	Interpretation
Stigma	-0.45	<0.001	Higher stigma independently associated with lower HRQoL
Employment Status	+0.32	0.005	Being employed associated with higher HRQoL
Gender (Female)	-0.25	0.01	Females have lower HRQoL than males independently
Rural Residence	-0.29	0.003	Residing in rural areas associated with lower HRQoL

Note: Negative coefficients indicate factors associated with decreased HRQoL; positive coefficients indicate factors associated with increased HRQoL

The data reveal significant gender disparities in HRQoL, with females reporting lower scores across all domains, likely reflecting societal and cultural factors such as higher perceived stigma and limited social support. Higher perceived stigma is strongly linked to poorer wellbeing, emphasizing the detrimental impact of social discrimination on mental and physical health. Employment and urban residence are associated with better HRQoL, indicating that socio-economic stability and access to healthcare resources play vital roles in improving quality of life for PLHIV. The multivariate analysis confirms that these factors independently influence HRQoL, highlighting the need for targeted interventions addressing stigma reduction, economic empowerment, and healthcare access, especially among women and rural populations, to bridge the wellbeing gap in this community.

Table 5. Findings by Facility in Gombe State

Facility Name	Number of Participants	Mean HRQoL Score	Gender Distribution (M/F)	Average Stigma Score	Location
Federal Teaching Hospital Gombe	40	62.3	20 / 20	3.2	Urban
IDH Zambuk	40	60.8	22 / 18	3.4	Urban
General Hospital Dukku	40	50.2	20 / 20	4.1	Rural
Cottage Hospital Bamboo	40	52.4	21 / 19	3.9	Rural
Nafada General Hospital	40	49.8	20 / 20	4.3	Rural
General Hospital Kaltungo	40	61.2	21 / 19	3.1	Urban
General Hospital Kashere	40	51.5	20 / 20	4.0	Rural
General Hospital Kumo	40	59.3	20 / 20	3.3	Urban
Bojude Cottage Hospital	40	50.1	20 / 20	4.2	Rural

The data reveal notable disparities in HRQoL and perceived stigma among HIV patients across different healthcare facilities in Gombe State, reflecting the influence of geographic location on patient wellbeing. Patients attending urban facilities—such as the Federal Teaching Hospital Gombe, IDH Zambuk, General Hospital Kaltungo, and General Hospital Kumo—reported higher average HRQoL scores (ranging from approximately 59 to 62). In contrast, those attending rural facilities—including General Hospital Dukku, Cottage Hospital Bamboo, Nafada General Hospital, General Hospital Kashere, and Bojude Cottage Hospital—reported significantly lower HRQoL scores (around 49 to 52). Additionally, perceived stigma was generally higher in rural settings (average stigma scores exceeding 4), which correlates with the lower HRQoL scores observed in these facilities. This suggests that residents of rural areas may face greater social discrimination, limited access to healthcare resources, and socio-economic challenges that negatively impact their wellbeing. Although gender distribution was balanced across all facilities, females consistently reported lower HRQoL scores compared to males, especially in rural areas where stigma and access issues are more pronounced. These findings underscore the importance of addressing geographic and socio-cultural disparities, focusing on stigma reduction and improving healthcare access in rural communities to enhance overall quality of life for people living with HIV. Despite high ART retention rates (96%), women in Gombe exhibited significantly poorer HRQoL across multiple domains. Elevated stigma levels, unemployment, rural residence, and gender disparities were strongly associated with reduced well-being, underscoring the complex interplay of sociocultural and structural factors influencing health outcomes.

4 DISCUSSION

This study provides critical insights into the disparities in health-related quality of life (HRQoL) among people living with HIV in Gombe State, Nigeria, emphasizing the influence of demographic, geographic, and social factors. The demographic profile revealed a balanced gender distribution with a median age of 39.2 years, reflecting the active working-age population most affected by HIV. The majority of participants resided in rural areas (62%) and had been on ART for a median of 2.5 years, indicating a diverse cohort in terms of treatment duration and socio-economic backgrounds. Gender **disparities** in HRQoL were pronounced, with females reporting significantly lower scores across all domains, consistent with previous findings in Nigerian populations [1, 2]. Women often face compounded challenges such as gender-based violence, limited access to social support, and cultural norms that stigmatize HIV, which adversely impact their mental and physical wellbeing [3]. The higher perceived stigma among females (mean stigma score 3.8) compared to males (mean 3.2) further exacerbates these disparities [4]. Elevated stigma levels are well-documented barriers to healthcare access, treatment adherence, and social integration, leading to poorer HRQoL outcomes [5]. The analysis also demonstrated stark differences between urban and rural residents. Participants attending rural facilities reported lower HRQoL scores (average ~49-52) and higher stigma (average stigma score >4). These disparities are consistent with existing literature, which highlights that rural communities often have limited healthcare infrastructure, lower health literacy, and stronger social norms that stigmatize HIV [6, 7]. High stigma in rural settings impedes disclosure, social support, and engagement with healthcare services, thereby negatively influencing mental health and overall wellbeing [8]. Employment status emerged as a significant predictor, with employed individuals reporting higher HRQoL scores. Economic stability and social participation may buffer the adverse effects of HIV-related stigma, underscoring the importance of economic empowerment in improving health outcomes [9]. Conversely, unemployment and socio-economic deprivation are linked to increased psychological distress and social isolation, further deteriorating HRQoL [10]. The multivariate analysis confirmed that perceived stigma**,** rural residence**,** female gender**,** and unemployment independently predicted poorer HRQoL. These findings highlight the complex interplay of social, economic, and geographic factors influencing wellbeing among PLHIV. Addressing these issues requires multifaceted interventions that target stigma reduction, promote gender equity, improve healthcare access in rural areas, and foster economic opportunities. Limitations of this study include its cross-sectional design, which limits causal inferences, and potential reporting bias associated with self-reported measures of stigma and quality

of life. Nonetheless, the findings underscore the urgent need for culturally sensitive strategies to mitigate stigma and enhance healthcare delivery, particularly in rural settings and among women, to improve HRQoL among PLHIV in Nigeria.

Policy Implications and Future Research

The findings highlight the need for targeted policies to reduce stigma, especially in rural areas, and to promote gender-sensitive interventions that empower women and improve access to healthcare. Strengthening healthcare infrastructure, expanding community-based programs, and integrating mental health services are essential to enhance HRQoL among PLHIV. Additionally, economic empowerment initiatives can address socio-economic barriers impacting wellbeing. Future research should focus on longitudinal studies to establish causal relationships, evaluate the effectiveness of stigma reduction and empowerment programs, and explore innovative approaches like digital health interventions. Further qualitative studies are also needed to understand cultural influences on stigma and gender roles, guiding more culturally appropriate policies across diverse Nigerian settings.

5 CONCLUSIONS

This study highlights significant disparities in HRQoL among people living with HIV in Gombe State, Nigeria, influenced by gender, geographic location, and perceived stigma. Women and rural residents experience poorer wellbeing, driven by social discrimination, limited healthcare access, and socio-economic challenges. Addressing these barriers through targeted policies, stigma reduction, and socio-economic empowerment is crucial to improving quality of life. Future research should focus on longitudinal and intervention studies to develop sustainable, culturally appropriate strategies for enhancing wellbeing among all PLHIV in Nigeria.

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CONFLICTS OF INTEREST

The authors declare no conflicts of interest related to this study. Author Contributions

- Conceptualization: Suraj Abdulkarim, Paul Balogun, Bappah Lawan.
- Data Collection: Suraj Abdulkarim, Paul Balogun.
- Formal Analysis: Bappah Lawan, Suraj Abdulkarim.
- Methodology: Abdulrazaq Abubakar Ahmad, Bappah Lawan.
- Project Administration: Suraj Abdulkarim, Bappah Lawan.
- Writing – Original Draft: Suraj Abdulkarim, Bappah Lawan.
- Writing – Review & Editing: Suraj Abdulkarim, Paul Balogun, Abdulrazaq Abubakar Ahmad, Joseph Kuye.

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